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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/826,661	04/05/2001	Yongjun Hu	303.098US4	4539

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EXAMINER

NGUYEN, JOSEPH H

ART UNIT PAPER NUMBER

2815

DATE MAILED: 12/11/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

CA

**Office Action Summary**

Application No.

09/826,661

Applicant(s)

HU, YONGJUN

Examiner

Joseph Nguyen

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**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --****Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 06 October 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 48-54, 71-73, 75, 76, 82-89, 91-100, 102, 103 and 105-116 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 48-54, 82-89, 91-97 and 106-116 is/are allowed.
- 6) ☒ Claim(s) 71-73, 75, 76, 98-100, 102, 103 and 105 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 April 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. §§ 119 and 120**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)                      4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)                      5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_                      6) ☐ Other: \_\_\_\_\_

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### **DETAILED ACTION**

In view of the appeal brief filed on 10/06/2003, PROSECUTION IS HEREBY REOPENED. A new ground of rejection is set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

- (1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,
- (2) request reinstatement of the appeal.

If reinstatement of the appeal is requested, such request must be accompanied by a supplemental appeal brief, but no new amendments, affidavits (37 CFR 1.130, 1.131 or 1.132) or other evidence are permitted. See 37 CFR 1.193(b)(2).

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 71-76 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 71 recites the limitation "the substrate" in 2. There is insufficient antecedent basis for this limitation in the claim.

Claims 72-76 are also rejected due to their dependency upon the rejected base claim 71 above.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 71-73, 75-76, 98-100, 102-103, 105 are rejected under 35 U.S.C. 102(e) as being anticipated by Chen.

Regarding claim 71, Chen discloses on figure 3B in a semiconductor device, a contact hole 35 in a layer of insulator material 33 directly overlying on the substrate 31, the hole comprising a bottom surface having at least one generally planar layer of conductive material including a silicide of refractory metal 36; a substrate 31 having a profile that does not change significantly in the vicinity of the contact hole 35; and a vertical sidewall consisting substantially entirely of the aforementioned layer of insulator material 33.

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Regarding claim 72, Chen discloses on figure 3B the planar layer contacts the lower end of the sidewall.

Regarding claim 73, Chen discloses on figure 3B the planar layer does not extend substantially up the sidewall from the bottom surface.

Regarding claim 75, Chen discloses on figure 3B the planar is titanium silicide.

Regarding claim 76, Chen discloses the refractory metal is cobalt (col. 4, lines 30-31).

Regarding claim 98, Chen discloses on figure 3B an integrated circuit comprising a substrate 31; a layer of insulating material 33 overlying the substrate and containing at least one contact hole 35 having only that layer as a sidewall and having a bottom surface contacting the substrate; and at least one generally planar layer of a silicide of a refractory metal 36 where the profile of the substrate does not change substantially in the vicinity of the contact hole.

Regarding claim 99, Chen discloses on figure 3B the planar layer 36 contacts the lower end of the sidewall.

Regarding claim 100, Chen discloses on figure 3B the planar layer 36 does not extend substantially up the sidewall from the bottom surface.

Regarding claim 102, Chen discloses on figure 3B the planar layer 36 includes a silicide of titanium.

Regarding claim 103, Chen discloses the refractory metal is cobalt (col. 4, lines 30-31).

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Regarding claim 105, Chen discloses on figure 3B the planar layer contacts the lower end of the sidewall.

***Allowable Subject Matter***

Claims 48-54, 82-89, 91-97, 106-116 are allowed.

***Response to Arguments***

Applicant's arguments filed on 10/06/2003 have been fully considered but they are not persuasive.

With respect to claims 71 and 98, claims 71 and 98 do not include "graded stoichiometry". Also, the claim limitation "in the vicinity" is broad and Chen shows no substrate profile change on either side of the contact hole. Lastly, the vertical sidewall of "the hole" is comprised of the edge of layer 33 in Chen.

***Conclusion***


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph Nguyen whose telephone number is (703) 308-1269. The examiner can normally be reached on Monday-Friday, 7:30 am- 4:30 pm

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (703) 308-2772. The fax phone number for the organization where this application or proceeding is assigned is (703) 308-7382 for regular communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

JN  
December 1, 2003

  
**GEORGE ECKERT**  
**PRIMARY EXAMINER**